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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/428,125	10/26/1999	VISHNU K. AGARWAL	MI22-1299	4264

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EXAMINER	
ROSE, KIESHA L	

ART UNIT	PAPER NUMBER
2822	

DATE MAILED: 12/01/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/428,125	AGARWAL ET AL.	
	Examiner	Art Unit	
	Kiesha L. Rose	2822	

-- The MAILING DATE of this communication appears on the cover she t with the correspond nc address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 September 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☐ Claim(s) _____ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *38,42-43 and 46-53* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

This Office Action is in response to the RCE filed 16 September 2003.

Election/Restrictions

Applicant's election with traverse of claim 55 in Paper No. 22 is acknowledged. The traversal is on the ground(s) that the claim is directed toward a product not a process. This is not found persuasive because as the claim limitations state that the layer is "deposited" and then "annealing" the layer on the polycrystalline layer. These limitations are process limitations and even though there is a product that is going to be formed there are still method limitations that are in the claim and therefore are processes that the product need to go through in order to be formed. Therefore it is a product-by-process claim and is able to be restricted and considered two different inventions.

The requirement is still deemed proper and is therefore made FINAL.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 38, 42,46,47 and 51-52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuda et al. (U.S. Patent 6,143,597) in view of Roh (U.S. Patent 5,783,253).

Matsuda discloses a capacitor (Fig. 1d), which contains a lower electrode (2) and an upper electrode (4) with two dielectric layers (5,8) formed there between on an entire capacitor dielectric region consisting of essentially the composite of the two dielectric materials. The two dielectric layers are crystalline and since the dielectric layers are made from the same material they will have the characteristics that make the crystalline layers have a lateral shift in grain boundaries from one layer to the other with one of the dielectric layers has a thickness from 10% to 90% of the combined thickness. Matsuda discloses all of the limitations except for the dielectric materials to be of a titanate compound. Whereas Roh discloses a capacitor (Fig. 1e), which contains a first electrode (4) and a second electrode (8) with two immediately juxtaposed and contacting barium strontium titanate (BST) dielectric layers (6, 7). The two dielectric constants are formed of BST because they consist of high dielectric constants, which improve the capacitor device. (Column 3, lines 1-3) Since Matsuda and Roh are both from the same field of endeavor, the purpose disclosed by Roh would have been recognized in the pertinent art of Matsuda. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the capacitor of Matsuda device by incorporating two dielectric layers made of a titanate compound because it has a high dielectric constant which improves the capacitor device as taught by Roh.

Claims 43 and 48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuda and Roh in view of Fujii et al. (U.S. Patent 5,661,319).

Matsuda and Roh disclose all of the limitations except for the dielectric layers to be Ta_2O_5. Whereas Fujii discloses a capacitor (Fig. 1) with two dielectric layers formed of Ta_2O_5. Instead of the dielectric layers being made both of titanate compounds they can both also be made of tantalum pentoxide. Having both of the dielectric layers made of tantalum pentoxide allows them to act as a diffusion barrier, which prevents the diffusion of silicon into the dielectric film. (Column 3, lines 47-53) Since Matsuda, Roh and Fujii are both from the same field of endeavor, the purpose disclosed by Fujii would have been recognized in the pertinent art of Matsuda and Roh. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the capacitor of Matsuda and Roh by incorporating two dielectric layers made of tantalum pentoxide to prevent the diffusion of silicon into the dielectric film as taught by Fujii.

Claims 49, 50 and 53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuda and Roh as applied to claims 38 and 51 above, and further in view of Park et al. (U.S. Patent 5,780,115).

Matsuda and Roh disclose all of the limitations except for one of the electrodes to comprise titanium nitride. Whereas Park discloses a capacitor (Fig. 3) that contains titanium nitride electrodes (15/19) with a dielectric layer (17) therebetween. The electrodes are made of titanium nitride in order to reduce the oxide grown between the electrode and dielectric layer therefore reducing the thickness of the dielectric material.

(Column 1, lines 51-65) Since Matsuda, Roh and Park are both from the same field of endeavor, the purpose disclosed by Park would have been recognized in the pertinent art of Matsuda and Roh. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the capacitor of Matsuda and Roh by incorporating one of the electrodes to be titanium nitride to reduce the oxide grown between the electrode and dielectric layer therefore reducing the thickness of the dielectric material as taught by Park.

Response to Arguments

Applicant's arguments filed 16 September 2003 have been fully considered but they are not persuasive. Referring to the argument of the Roh reference dealing with the two dielectric layers, the process in which they are formed does not matter since the claimed invention is a device and the process in which it is formed is not measured in regards to the claimed. As noted by the applicant's arguments that the Roh reference teaches away from it by showing the page and column numbers (Col. 1, lines 45-67 and Col. 2 lines 1-2) these paragraphs do not show teaching away from uses two BST dielectric layers between the electrodes they just teach away from the use of how it was formed in regards to MOCVD (metal organic chemical vapor deposition) and RTA (Rapid Thermal Annealing) where being these are method limitations and are not considered in product claims. So the two dielectrics to be BST are still disclosed by the Roh reference and therefore the rejection stands.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kiesha L. Rose whose telephone number is 703-605-4212. The examiner can normally be reached on M-F 8:30-6:00 off 2nd Monday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian can be reached on 703-308-4905. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

KLR

AMIR ZARABIAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800